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IN THE APPLICATION

OF

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AND

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FOR A

HEAD APPAREL EMBROIDERY HOOP AND ALIGNMENT DEVICE

HEAD APPAREL EMBROIDERY HOOP AND ALIGNMENT DEVICE

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to embroidery. More specifically, the invention is a device for aligning and holding a hat, visor, or other head apparel in place in a sewing machine or an embroidery machine.

2. DESCRIPTION OF THE RELATED ART

Modern embroidery machines are typically operated under computer control. Various devices and improvements have been designed to adapt modern embroidery machines for sewing logos, monograms, emblems, and various other designs and patterns on hats popularly known as baseball caps. The cap will typically be placed in a clamping device known as a cap frame, referred to generally as a hoop, the hoop in turn being mounted on a computer controlled hoop guide, also known as the X-Y driver, of an embroidery machine, the hoop guide being manipulated to present different sewing areas to the sewing head of the embroidery machine.

It should be noted that the manners by which hoops are attached and/or released from an embroidery machine on the one

hand, and a bracket attached to a hooping device work surface on the other hand, often differ significantly. U.S. Patent No. 5,555,828, issued to Donald G. Rowley in September, 1996, discloses a hoop attachment assembly for accurately and securely mounting an embroidery hoop frame to the embroidery machine. Similarly U.S. Patent No. 5,630,370, issued to Mathias Herbach in May, 1997, discloses a device for detachably fastening an embroidery frame to the X-Y driver of an embroidery machine.

Ronald Inteso, in U.S. Patent No. 4,598,488 issued in July 1986, presents an alternative approach for an embroidery frame, in which the hoop is easily mounted directly to an embroidery machine without a special adaptor. The '488 patent describes an embroidery frame for caps having a top element and a bottom element to clamp the brim at its free end, with clips extending over the top surface of the brim from under the top element of the clamp to the base of the cap. A clamp extends across the frame and comprises a cross-member with a number of teeth that penetrate and grab a portion of a hat to be embroidered. Inteso describes an improvement to this device in U.S. Patent 4,831,753, issued May 23, 1989, in which the brim of the cap is held between a front member of the frame and a clamp. The front member has a lever mounted thereon, which raises and lowers a curved rod that secures the cap at the rear of the brim. It will be noted that the

purpose of the clips of the first device and the rod of the second device is to pull the front face of the cap taut in order to minimize distortion in the sewing, and that the position of the lever necessarily limits the sewing head's access to the sewing area.

U.S. Patent No. 5,884,571, issued to Valadez et al. in March, 1999, discloses a embroidery hoop assembly which retains a fabric workpiece securely in place by the use of two securing members, a main clamp to hold the wide end of the workpiece, and an elastic restraint to hold the free end. The main clamp has a wide, spring-loaded bar cooperating with a fixed support to keep the fabric taut over its width, while the elastic restraint keeps the fabric pulled flat, so that the embroidery can be properly applied.

U.S. Patent No. 3,664,288, issued to Weidlin Von Boden et al. in May, 1972, discloses a fabric-holding clamp for embroidery machines comprising a pair of hinged, triangular-shaped plates between which a fabric piece is inserted. Compressible, non-slip areas hold the fabric taut across openings in the plates.

Other devices which improve the embroidery process include: U.S. Patent 5,598,797, issued February 4, 1997 to Dennis W. Patterson, describing an alignment stand for aligning the cap in the cap frame before securing it to the machine; U.S. Patent

5,649,496, issued to Morita, et al. July 22, 1997, for improved means to stitch on the temporal area of the cap; and U.K. Patent 2,228,749, published September 5, 1990, describing a device to clamp a frame in an embroidery machine using three-point clamping of the frame.

A problem, which has not been adequately addressed by the conventional devices results from the hat not being in proper alignment with the embroidery frame. This is especially true in regards to the rear of the hat, which, if incorrectly aligned, would tend to offset the embroidered design on the soft portion of the hat regardless of whether the front bill of the hat is aligned and secured.

None of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed. In particular, none are seen to describe a hat hoop that enables a user to align both the front and rear of a hat in an embroidery frame. Thus a hat frame for embroidery solving the aforementioned problems is desired.

SUMMARY OF THE INVENTION

5 The present invention is a head apparel embroidery hoop and alignment device for use in conjunction with a machine for embroidering and monogramming hats.

10 The device may be made of any non-metallic, thermoplastic material and works by clamping the head apparel, such as a baseball cap, between a movable plate and a frame having a stationary planar surface. Threaded posts captured by threaded knobs provide the clamping force securing the hat brim to the frame. The device uses alignment marks to ensure the correct axial alignment for the article to be embroidered. The bottom of the device is smooth to ensure good adhesion with a sheet of adhesive stabilizing material, which is used to hold the article
15 in position.

The device is utilized by aligning the embroidery hoop inside a shaped containment hoop provided by the manufacturer of the embroidery machine, using alignment indicia disposed on both the perimeter of the embroidery hoop and the containment hoop.

20 Accordingly, it is a principal object of the invention to provide a head apparel embroidery hoop and alignment device that has an embroidery frame that includes indicia facilitating the

alignment of a hat or similar item of apparel within the frame during embroidering.

5 It is another object of the invention to provide a head apparel embroidery hoop and alignment device having a molded plastic frame fitting within the containment hoop of a pre-determined embroidering machine.

10 It is a further object of the invention to increase the available sewing area on the front surface of a cap by providing a head apparel embroidery hoop and alignment device that has an alignment plate to prevent the brim from obstructing the sewing area of the cap.

15 Still another object of the invention is to provide an economical head apparel embroidery hoop and alignment device for improving the efficiency of embroidering machines as they are used to place embroidering on caps.

It is an object of the invention to provide improved elements and arrangements thereof in an apparatus for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

20 These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a top view of a head apparel embroidery hoop and alignment device according to the present invention.

Fig. 2 is an exploded perspective view of the head apparel embroidery hoop and alignment device according to the present invention..

Fig. 3 is a side perspective view of the frame portion of the head apparel embroidery hoop and alignment device according to the present invention..

Fig. 4 is a bottom perspective view of the hat brim retaining plate of the head apparel embroidery hoop and alignment device according to the present invention..

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is a head apparel embroidery hoop and alignment device, designated generally as 100 in the drawings. The embroidery hoop 100 shown in Fig. 1 comprises a frame 102 defining an opening adapted for receiving a hat to be embroidered, the frame 102 being substantially flat and planar and having an outer perimeter 122 adapted to be secured in the matching standard containment hoop 110 of an embroidery machine.

A removable hat brim retaining plate 104 cooperatively engages the hat bill portion of a cap 108, securing the cap 108 between the retaining plate 104 and the frame 102. A centered rear groove 114, disposed in the rear of the frame 102, facilitates proper alignment of the hat within the embroidery hoop 100.

The embroidery hoop 100 is made of a non-metallic, thermoplastic material and may be molded to fit the outer containment hoop 110 of almost any embroidery machine known to those in the embroidery arts. As best illustrated by the exploded view of the embroidery hoop 100 in Fig. 2, the clamping force acting upon the retaining plate 104 is provided by threaded knobs 106 tightened on threaded posts 202 which are molded in the frame 102 and which pass through apertures 206 cut in the retaining plate 104.

Figs. 2 and 3 illustrate the curved radius of the interior perimeter 120 of the frame 102, the radius serving to deflect errant movements of the embroidery needle outside of the embroidery area, which unless deflected, would cause the embroidery needle to break against the hard flat surface of the frame 102.

Fig. 3 further illustrates the sloped ribbed surface 112 of the portion of the frame 102 disposed directly underneath the retaining plate 104. The inward sloping surface 112 prevents

distortion of the embroidered surface by advantageously angling the brim of the hat, thereby providing a smooth and continuous transition from the top surface of the frame 102 to the surface of the adhesive stabilizer 204. The ribbing on the surface 112
5 beneath the hat bill operates to retain the hat in proper alignment with frame 102.

The retaining plate 104 which secures the hat bill in an aligned position against the frame 102, has a left side, a right side, a proximate end and a distal end, the proximate end having
10 two apertures 206 cut therein, the left and right sides converging in a point 124 extending generally to the inner perimeter 120 of the frame 102. As shown in Fig. 4, the bottom surface 406 of the retaining plate 104 is defined by first and second ledges 402, 404, wherein the ledges cooperatively engage
15 the hat bill. The ledge 404, disposed at the point 124, biases the hat bill against the ribbed surface 112 of the frame 102 when the retaining plate 104 is clamped thereon.

The device has alignment marks 116 disposed on the outer perimeter 122 of the frame 102 to ensure correct alignment within
20 the containment hoop 110 of the embroidery machine. Furthermore, alignment markings 118 disposed on the retaining plate 104 and a V-groove 114 disposed on the frame 102 on the opposite side from

the retaining plate 104 enable proper alignment of the hat within the embroidery hoop 100.

The bottom of the frame 102 is smooth to ensure good adhesion with a sheet of adhesive stabilizing material 204, which advantageously secures the area to be embroidered in the desired position.

The embroidery hoop 100 is best utilized by securing the hoop 100 within an existing shaped containment hoop 110, the alignment of the inner hoop 100 with the outer containment hoop 110 being facilitated by alignment marks disposed on both devices. Once the front of the hat 108 is aligned and secured under the retaining plate 104, the user can have the rear seam stretched and centered immediately using the V-groove 114 disposed on the opposite side of the frame 102. Depressing the area to be embroidered into the adhesive stabilizer 204 while the seam is centered maintains the cap 108 in proper alignment during embroidery.

It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.